**MATH 2310**

**Hypothesis Testing**

This lab will deal with hypothesis tests. In this lab, you will use software to calculate summary statistics for data, and then use those summary statistics to conduct a hypothesis test by hand.

Goals for this assignment:

* Use R to generate summary statistics
* Practice calculations for hypothesis tests by hand
* Interpret results of hypothesis tests

Grading: there are four possible points for each skill objective and analysis objective.

**Activity 1**

In previous labs, we looked at a research paper from 1983 by Chambers, Cleveland, Kleiner, and Tukey examining the effectiveness of cloud seeding using silver nitrate. Total rainfall (in acre-feet) was measured for 26 seeded clouds and 26 unseeded clouds. We will again be examining this data set further.

We would like to use a hypothesis test to assess whether cloud seeing is effective. As we have small sample sizes, we need to be able to assume our data is approximately normally distributed. In a previous lab, you showed that the histograms for this data are extremely skewed. However, many of you noted that using a log transformation resulted in data that looked approximately normally distributed.

**Skill Objective: Use R to take a log transformation of the rainfall data. Then, use R to calculate the means and standard deviations for the log of rainfall for seeded clouds, and for unseeded clouds.**

**Analysis Objective: Using these results, conduct a hypothesis test to determine whether there is evidence that cloud seeding increases rainfall.**